

HYPERLIPIDEMIA / HYPERCHOLESTEROLEMIA (ICD9 272.0)

Revised Sep 2005, CPT Matthew Hoefer, MC, FS

AEROMEDICAL CONCERNS: Coronary Artery Disease (CAD) or Coronary Heart Disease (CHD) is the leading cause of permanent suspension from flying duties and non-accidental, premature death in aircrew members. In an effort to reduce the risk of CAD, it is necessary to reduce or prevent the identified risk factors such as hyperlipidemia (HLD). With the availability of highly efficacious statin drugs, and with newer clinical trials demonstrating a profound effect of these drugs in primary and secondary prevention of coronary artery disease, there is now widespread agreement that primary treatment of HLD is indicated. An increase in CAD risk occurs with elevated plasma cholesterol, increased low density lipoprotein (LDL), and reduced high density lipoprotein (HDL).

WAIVERS versus INFORMATION ONLY: Hypercholesterolemia and any drug therapy are disqualifying for initial flight applicants. **Hypercholesterolemia controlled by either diet or by those drugs listed below is not disqualifying for aircrew members and no waiver is required.** This information is filed **Information Only**. Several drugs listed require monitoring and annual submission of additional information with FDME. Submitted physicals without required laboratory values will be returned for completion. Waiver submission is reserved for complicated cases where side effects or aeromedical issues inhibit safe use of the below listed medications, or permanent medical complications resulting from their use.

INFORMATION REQUIRED:

- ☐ For an accurate lipid profile determination: the patient should fast for 9-12 hours, with only water or fat-free fluids allowed. The aircrew member should be on a normal diet for the previous 2 weeks; have no illnesses, operation or injury for the previous 4 weeks; and no minor febrile episode for 1 week.
- ☐ Causes of secondary hyperlipidemia such as hypothyroidism, diabetes, obstructive liver disease, (cholestasis), alcohol abuse, gout, renal failure, nephrotic syndrome, myeloma, systemic lupus erythematosus and use of drugs that may increase LDL cholesterol or decrease HDL cholesterol (progestins, anabolic steroids, and corticosteroids) should be excluded via history and appropriate laboratory testing, imaging for liver disease, and consultation with specialists as required. For assistance in determining evaluation requirements, contact USAAMA staff.
- ☐ Aircrew members of any age with serum cholesterol values greater than or equal to 240 mg/dl (High risk for CAD based on NCEP) should be evaluated for treatment with options as listed below.

FOLLOW-UP: Follow-up for specific drug regimens is listed below. Annual submission of plasma cholesterol and HDL are required.

TREATMENT: The first line of treatment for mild cases is Therapeutic Lifestyle Changes (TLC) including dietary control, weight loss, and increased aerobic exercise. Use of medication should be determined by current standards of care as proposed by the Adult Treatment Panel III (ATP III) of the National Cholesterol Education Program (NCEP). The first drug of choice is the statins, possibly in concert with ezetimibe, followed by bile acid binding resins and then nicotinic acid. Use of ferric acids is generally reserved for cases with significant hypertriglyceridemia. Recommended laboratory follow-up is as listed below for each medication class. Report a current (within 90 days) set of values as specified for medication class on annual FDME.

- **HMG CoA Reductase Inhibitors (Statins):** LOVASTATIN, PRAVASTATIN, SIMVASTATIN, ATORVASTATIN, and FLUVASTATIN, ROSUVASTATIN. Liver Function tests (LFTs) and CPK prior to initiating treatment and 6-12 weeks after the start of therapy, annually thereafter. Lipid profile 3-6 months after initial therapy to determine efficacy and annually thereafter. (Rare concern for Rhabdomyolysis)
- **Ferric Acids:** GEMFIBROZIL, FENOFIBRATE, CLOFIBRATE. Prior to initiating treatment and at 3, 6, and 9 months, then annually- do LFTs to include bilirubin and LDH, CPK, CBC and

- complete Lipid Profile. (Hypersensitivity, fatigue, dyspepsia, hepatic dysfunction, dizziness, depression and blurred vision have been reported).
- **Bile-Acid Binding Resins:** CHOLESTYRAMINE, COLESTIPOL. Lipid profile prior to initiation. Recheck Lipid profile at 2-4 weeks for efficacy. Submit prothrombin time and serum calcium annually. (These drugs cause constipation and interact with such drugs as hydrochlorothiazide, penicillin and tetracycline. Additionally, they may cause Vitamin A, D, E, K, folic acid, magnesium, iron, zinc deficiency)
 - **Nicotinic Acid:** NIACIN, NIASPAN. Serum glucose and uric acid 6 months after initiation. LFTs every 6-12 weeks for the first year and then every 6 months thereafter. (<1% incidence of elevated LFT's, possibility of fulminant hepatic necrosis)
 - **Cholesterol Absorption Inhibitors:** EZETIMIBE. LFT's prior to initiating treatment and Lipid Profile 6-12 weeks after initiation, annually thereafter. Evaluate for muscle ache/myalgias at follow up visits. Use with statin therapy is aeromedically acceptable provided providers follow the information requirement for both medications.

DISCUSSION: The treatment of mild/moderate cases of HLD is becoming increasingly recommended as a preventive strategy for CAD. The primary target for therapy is the LDL with an optimal goal of <100 mg/dl. In determining which patients to treat, LDL-C concentrations should be below 160 mg/dL in patients with less than two CHD risk factors. A lower value of 130 mg/dL is recommended in patients with two or more CHD risk factors. Major CHD risk factors, other than increased LDL, include: tobacco use, hypertension (>140/90), low HDL Cholesterol (<40 mg/dl), family history of premature CAD (first degree relative male < 55 y/o and female <65 y/o) and age (male > 45 y/o and female > 55 y/o). Information regarding treatment of hyperlipidemia is continually evolving, and providers should remain current with the latest treatment recommendations.

REFERENCE:

1. *Third Report of the Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III)*. NIH: National Heart Lung and Blood Institute, NIH 01-3670, May 2001. <http://www.nhlbi.gov/guideline/cholesterol/profmats.htm>
2. *Implications of Recent Clinical Trials for the National Cholesterol Education Program Adult Treatment Panel III Guidelines*. Circulation. 2004; 110:227-239.